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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,853	11/25/2003	Ramgopal Darolia	130719	8029

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EXAMINER	
MCNEIL, JENNIFER C	

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/721,853	DAROLIA ET AL.	
	Examiner	Art Unit	
	Jennifer C. McNeil	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 6-34* is/are rejected.

7)☒ Claim(s) *35 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 6-11, 13-21, 23, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Brindley et al (US 6,093,454). Brindley teaches a thermal barrier coating comprising a first bond coat layer applied to a metal substrate, and a second bond coat layer of MCrAlX with particles dispersed therein. The preferred particulate is alumina. The particles preferably have a diameter of less than 5 microns. The amount of particulate that is added varies depending on the thermal expansion of the MCrAlX, the particulate, and the ceramic insulating layer.

Regarding claims 2, 3, 14-16, 27, and 28, as stated above, the particulate is alumina.

Regarding claims 6-8, 17, 18, 29, and 30, one example of the volume fraction of alumina is 0.71.

Regarding claims 9, 10, 19, 20, and 31, the range "less than 5 microns" is considered to include the claimed ranges.

Regarding claim 23, the thermal barrier layer may have a thickness of 80-140 mils

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 6-11, 13-25, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brindley et al (US 6,093,454). Brindley teaches a thermal barrier coating as discussed above, but does not give a specific example of a particulate with a diameter of less than 2 microns. However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the compositional proportions taught by Brindley of less than 5 microns is considered to overlap the instantly claimed proportions and therefore are considered to establish a prima facie case of obviousness. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claims 24 and 25, it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the coating with a thickness sufficient to provide protection to the underlying substrate.

Claims 1-3, 6-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wustman et al (US 6,485,845). Wustman teaches a thermal barrier coating comprising a bond coat with particles dispersed therein. The particles are oxides such as alumina, chromia, hafnia, zirconia, and lanthana. The bond coating comprises MCrAlX where X is Hf, Zr, Y, Ta, Pt, etc. The amount of particulates present is less than about 50 vol%, and the grain size of the particulate is less than about 45 microns.

Regarding claims 2, 3, 14-16, 27, and 28, as stated above, the particulate may be alumina, chromia, hafnia, zirconia, and lanthana, to name a few.

Regarding claims 6-8, 17, 18, 29, and 30, the volume fraction of the oxide particulate is up to about 50 volume percent, though it is foreseeable that greater or lesser oxide contents may be sufficient. Up to about 50 volume percent is considered to include the range of greater than zero to about 50%. While Wustman does not give further examples of the percentage of alumina, it would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claims 9, 10, 19, 20, and 31, the range "less than about 45 microns" is considered to include the range greater than zero to about 45 microns. While Wustman does not give further examples of the grain size of alumina, it would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

> "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages", In re Peterson 65 USPQ2d 1379 (CAFC 2003).

Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

Regarding claim 23-25, the thermal barrier layer thickness is generally about 75-300 microns, about 3-12 mils.

Regarding claims 11, 22, and 33, the bond coat may be a combination of MCrAlX and a diffusion aluminide.

Allowable Subject Matter

Claims 35 and 36 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed February 28, 2005 have been fully considered but they are not persuasive. Applicant argues that Brindley does not disclose particles having a size in the range of no more than about 2 microns. Brindley teaches particles of less than 5 microns, which is considered to include in it's range less than about 2 microns. Furthermore, Brindley's teaching is considered to render obvious the range of less than 2 microns as previously stated. Applicant has offered no argument with regard to the obviousness rejection.

Applicant argues that Brindley discloses that it's particles are dispersed in the upper bond coat layer, and not the lower bond coat layer. Applicant's attention is drawn to Example III where Brindley discusses a single layer bond coat in contrast with the two-layer system and teaches that the particles are well dispersed therein. It is noted that this argument applies only to claim 34.

Applicant argues that Brindley teaches the particulates cannot be nitrides or carbides or other specific oxides. For this reason, claims 35 and 36 are indicated as containing allowable subject matter.

Applicant argues that the type of bond coat taught by Brindley is an overlay and does not teach or suggest a diffusion bond coat. This argument is considered persuasive and overcomes the rejection over Brindley of claims 22, and 26-32.

Regarding Wustman, applicant argues that the particles can be as large as 45 microns. As stated previously, Wustman teaches particles with a diameter less than 45 microns and clearly states that smaller particles may be used, which is considered to overlap and render obvious the range of less than 2 microns. Applicant has offered no argument with regard to the obviousness rejection.

Applicant argues that the particles of Wustman are dispersed only in the upper additive layer. It is noted that this argument applies only to new claim 34.

Applicant argues that Wustman does not teach carbide or nitride particles. For this reason, claims 35 and 36 are indicated as containing allowable subject matter.

Applicant has offered no arguments regarding the obviousness rejections, and the teachings of Brindley are considered to encompass the particle range of the instant claims.

For the above reasons, claims 1-3, and 6-34 are rejected and claims 35 and 36 objected to as being dependent upon a rejected claim.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C McNeil whose telephone number is 571-272-1540. The examiner can normally be reached on 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer McNeil
December 13, 2004